A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova School of Business and Economics.

EQUITY RESEARCH – VERIZON INC.

Mariana Vilhena Gomes Serrumbia

Work project carried out under the supervision of:

Professor Francisco Martins

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Abstract

The Master Dissertation is an Equity Research on Verizon Inc. The purpose is to elaborate a detailed analysis of the company and to estimate, as of 31st December 2020 the expected share price. In this research it can be found an analysis of the trends and the competitive position of Verizon in its industry as well as the rationale behind the forecasted values and the value drivers.

Keywords: Verizon, Telecommunications, Equity Research, Valuation

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VERIZON COMMUNICATIONS

COMPANY REPORT

TELECOMMUNICATIONS

22 MAY 2020

STUDENT: MARIANA SERRUMBIA

A market perspective of the new telecommunication's area

How does 5G can change a stagnant sector?

- **Strong Player:** Verizon is the second largest telecom provider in the US market and detains a low customer churn rate (~1%). It also has more than 90% of coverage in US which confers a strong market positioning
- **Stable operating margins:** Verizon has been able to maintain a gross margin of 60% over the last years. Communication services, due to their characteristics, have larger innovation cycles which leads to smaller changes on operational costs over time
- **Dividends continue to grow:** Verizon has delivered dividends to its shareholders. On the current low interest rate environment, dividends can be an alternative source of reward. The company has a stable dividend yield ~4% and records a dividend growth of ~3%
- **Price War:** Since the industry faces a saturation on its market base, companies are competing over prices. The products have low diversification which pressures companies to partner with other major companies in other industries
- **Strong Market presence:** The company has outperformed several players in its sector as well as is being considered the most capable to deliver quality 5G services.

Company description

Verizon is a telecommunication provider, founded in 1983. The company operates through wireline and wireless solutions to consumers, businesses and institutions.
In 2018 the company achieved over 188 million wireless connections and has the largest coverage on US. The company is an industry leader, it already deployed 5G but it expects to increase its availability.

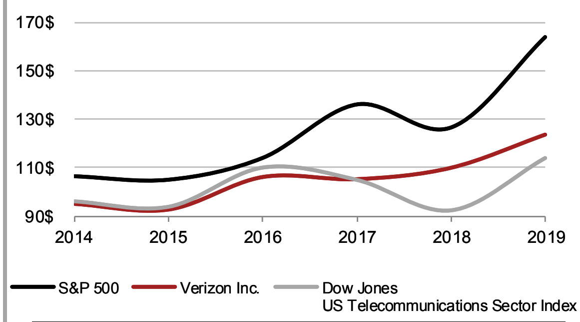
Recommendation:	**HOLD**
Price Target FY20:	**$64**
Price (as of 31/12/2019)	**$61.4**

Reuters: 03.05.2020

52-week range (€)	48.84-62.22
Market Cap (€m)	235.16
Outstanding Shares (m)	4 137

Source: Reuters

Total Return Among Verizon, S&P 500 and DJ Telecommunications Services Index



Source: Reuters

(Values in $ millions)	2018	2019	2020F
Key Statistics			
Market Cap		235.2	
Shares Outstanding (m)		4291	
Beta		0.8	
Dividend per Share	2.37	2.42	2.49
Price/Earnings	4.71	4.81	4.76
Profitability			
Operating Margin	36.3%	36.0%	36.7%
Profit Margin	11.9%	14.7%	15.6%
Return on Assets	6.2%	7.1%	7.1%
Return on equity	32.3%	33.6%	29.8%
No. of Subscribers	117	147	119

Source: Reuters | own computations

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Figure 4 – Verizon's Logo

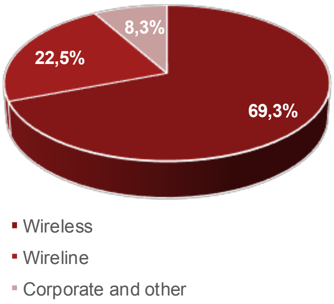
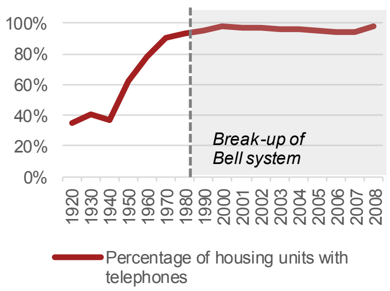


Figure 3 - Revenue distribution by segment in 2018
(Source: Verizon Annual Report)

Figure 5 - Bell Systems Logo



(Source: FCC)

Verizon Communications Inc. (hereinafter referred to as Verizon or the company) is a US-based telecommunication company founded in 1983. The main segments of this company are communication services, including wireline, wireless and media content. Additionally, Verizon also provides other network and business solutions to clients.

The company is structured in three operational groups: Wireless, Wireline, and Corporate and others. Geographically, Verizon supplies to over 150 locations around the world in its long-distance voice services, but its strongest presence is in the US[1], covering around 99%[2] of the US land-area regarding wireless communication.

1.1. Verizon's Emergence

Verizon Communications mostly developed after the merger between Bell Atlantic, one of the "Baby-Bells", and GTE in 2000.

The "Baby-Bells" companies came up from the US Justice Department decision of condemn Bell Systems of antitrust. The Bell System was the market leader, controlling over 80%[3] of telecommunication sector in 1984, and was forced to a break-up the company into several companies, on divestments proceeds. The intent was to promote competitive environment on the telecommunication sector by creating independent regional companies which were able to compete with one another.

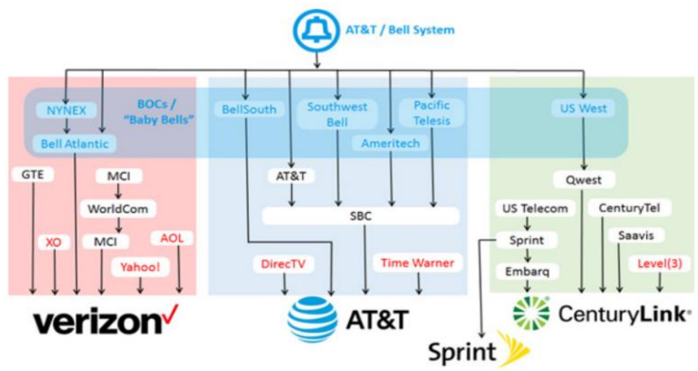


Figure 2 - "Baby-Bells" Consolidation

[1] Since the company's reporting is done on a product-centric vision, it does not state differences between US and rest of the world revenue recognition
[2] https://www.verizonwireless.com/featured/our-network/
[3] United States Senate Committee on the Judiciary. (1982). DOJ Oversight: USVAT &T.: Hearings Before the Committee on the Judiciary, United States Senate, Ninety-seventh Congress, First and Second Sessions, on the Department of Justice Oversight of the United States Versus American Telephone and Telegraph Lawsuit.

Figure 7 - Verizon Reportable Segments by Product

Holding %	Investor Name
7,9%	The Vanguard Group, Inc.
5,0%	BlackRock Institutional Trust Company, N.A.
4,0%	State Street Global Advisors (US)
2,7%	Wellington Management Company, LLP
1,5%	Geode Capital Management, L.L.C.

Figure 6 - Top 5 Verizon's larger shareholders in 2019 in % of total shares
(Source: Reuters)

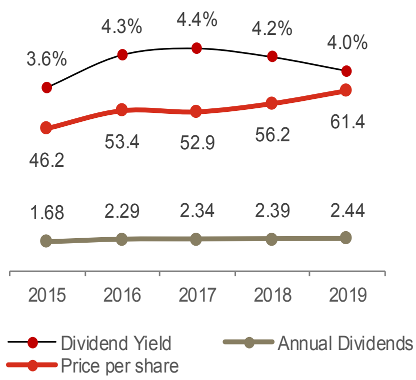


Figure 8 - Verizon historical dividend yield 2015-2019
(Source: Reuters and own computations)

After Verizon was created, the company's pursued a strong M&A strategy, acquiring other competing firms, such as MCI. This strategy enabled Verizon to position as a top player on the telecommunication sector.

In mid-2000, the company had more than 100 million customers connected to their services and became one of the top providers on up-to-date communication technology[4].

1.2 Ownership and Payout

The Company's shareholder structure is mostly dominated by institutional investors (holding ~69% of the company's common equity), which mitigates agency problems that may arise[5]. Hedge Funds and Investment Advisors are the main institutional investors of the company.

At December of 2018, the company was divided in 4 291 433 shares, each one entitled to one vote. As Figure 7 shows, the stock is highly disseminated and does not register dominant positionings. The share distribution of the largest ten institutional holders also reflects the significant dissemination of the company, since they control less than 25% of the company.

Regarding insider ownership[6] acting using their own name as individual investors (Appendix 1), hold less than 1% of Verizon's equity. The former CEO of Verizon, Lowell McAdam, owns 400k shares (0.01%), which places him as the largest induvial investor. All in all, the result demonstrates that Verizon has a fairly low level of insider ownership.

In terms of shareholder return, the Company has been increasing its dividends over time (on average, dividends have increased 2.3% a year), and they are distributed on a quarterly basis. From 2015 to 2019 the dividend yield has been stable, recording an average of 4.1%. The management projects to maintain the established dividend policy. Nonetheless, Verizon's potential to maintain the dividend payment depends on its ability to grow profits and cash flows.

By linking the steady revenue stream and the payout ratio of the company, it is expected that dividends will not continue to grow unless the company is able to engage in value-creation investments. Wireless and Corporate and Other are business areas expecting higher growth due to market trends.

[4] Kumar B.R. (2019) Acquisitions by Verizon. In: Wealth Creation in the World's Largest Mergers and Acquisitions. Management for Professionals. Springer, Cham
[5] Cornett, M. M., Marcus, A. J., Saunders, A., & Tehranian, H. (2007). The impact of institutional ownership on corporate operating performance. Journal of Banking & Finance, 31(6), 1771–1794. doi: 10.1016/j.jbankfin.2006.08.006
[6] Investors that given its status on the company are able to access non-public information

2. Operational Business

2.1 Verizon's Reporting Segments

2.1.1 Wireless

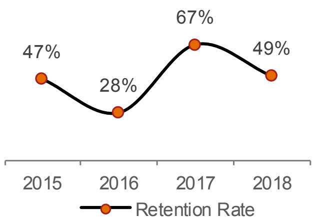


Figure 9 - Retention Rate
(Source: Own computations)

Figure 10 - Type of subscription in 2018
(Source: Verizon Reporting)

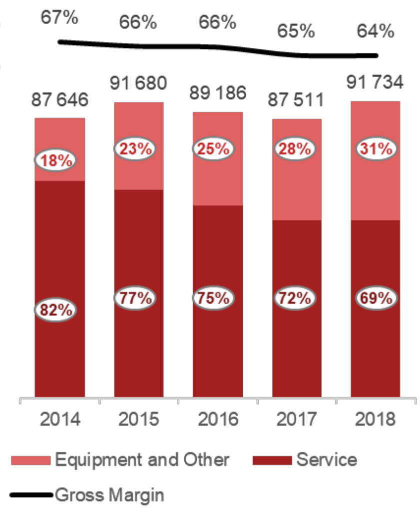


Figure 11 - Wireless Segments Revenue and Gross Margin, 2014-2018 (in $ million)
(Source: Verizon Annual Report)

This segment covers wireless communications including voice and data services as well as sale of equipment[7]. Verizon Wireless does business all over the US, selling services on a Postpaid and Prepaid basis[8].

The Company provides technological cellular services such as third-generation (3G), fourth-generation (4G), and Long-Term Evolution (LTE) technology. In 2018, Verizon was the second largest provider on the wireless sector, taking 30%[9] of the market share, surpassed only by AT&T which owns 39%[9] of wireless market share.

To cope with the recent technological improvements, Verizon is directing its Wireless strategy on the development of its fifth-generation (5G) network, focusing on industrial and commercial use cases since these are the services that will most require network capacity in future trends (e.g. self-driving cars) as well as being less price sensitive when rewarded by quality services. 5G combines faster exchange of data transmission with lower latency[10] levels. The urge of telecommunication companies ("telcos") to update their infrastructures, is based on the requirement to receive larger data-inflows mainly on areas such as IoT, self-driving technology and smart cities[11].

On the operational level, the segment reported, on average, in the last five years, ~$90 bn on revenues, representing ~69% of the total revenue. The retail postpaid plans accounted for most of the retail wireless connections[12].

The Wireless Service is divided into Services and, Equipment and Other. The segmentation occurs since Verizon Wireless further than providing data and voice

[7] The equipment sales relate with the selling of equipment products such as smartphones and tablets as well as other products that allow customers connection to the company's service
[8] A retail postpaid plan represents a subscription where the consumer is billed after the use of the Company's services, it assumes a contractual relation between the parties. Conversely, prepaid plans are based on an advanced payment in order to use voice and data services.
[9] FierceWireless, & Statista. (December 16, 2019). Wireless subscriptions market share by carrier in the U.S. from 1st quarter 2011 to 3rd quarter 2019
[10] 5G will allow for faster and better connections with the network what will enable the enhancement of digitalization across industries. (IoT Solutions World Congress, 2019)
[11] ADVANTAGES OF 5G AND HOW WILL BENEFIT IOT: IOT Solutions World Congress: DIGITALIZING INDUSTRIES. (2019, July 10). Retrieved from https://www.iotsworldcongress.com/advantatges-of-5g-and-how-will-benefit-iot/
[12] Retail connection represents a retail customers connection with Verizon Wireless that are directly served and managed by Verizon Wireless. It includes connections on smartphones, tablets, warbles and IoT devices. (Verizon. (2018). Annual Report 2018)

access it also sells wireless devices and accessories. The Equipment segment share has been increasing over time, accounting for more than 30% in 2018.

Over the last 5 years, although this segment has presented a stable revenue stream ranging from \$88 bn to \$92 bn, the gross margin has decreased 3 p.p. over the same timeframe.

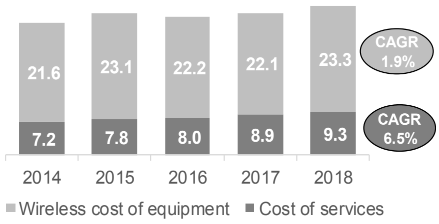


Figure 12 - Wireless Operating Expenses by component, 2014-2018 (in \$ billion)
(Source: Verizon Annual Report | own computations)

The operating costs of the segment are divided between Cost of Services and Costs of equipment. The former is mostly related to rent expenses of tower sites, maintenance network, and content transport and storage costs. The latter is directly related to acquisition costs of the equipment sold under the Equipment and Other caption.

The deterioration of gross margin is mostly driven by the increase of Wireless Costs of Services. The cell towers site rent expenses and the increase in content costs associated with license fees are the main causes for the steep increase in this caption.

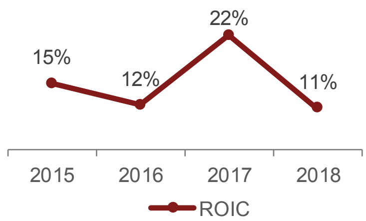


Figure 13 - Return on Invested Capital (ROIC), 2014-2018
Source: own computations)

As Figure 12 demonstrates, Verizon's ROIC has been decreasing[13] over the analysed period, reaching 21% in 2018. In the future, 5G investments are expected to worsen ROIC since the operating margin is expected to continue to follow a descent trend while invested capital is expected to increase over time.

Although 5G is advantageous, it may not be the solution to improve operational efficiency at a significant level. Given the new investment on the network, operating expenditures, such as energy consumption, may decrease 15%[14] due to this technology cost saving advantages. However, other cost such as network equipment, IT and spectrum licensing are expected to continue to increase which can lead to a decrease on Gross Margin pressuring ROIC to decrease.

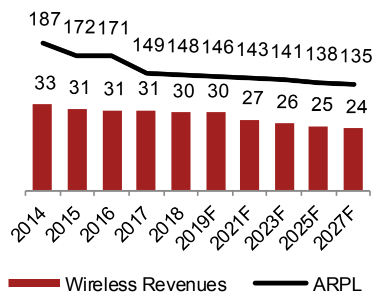


Figure 14 - Wireline Segments Revenue (in \$ m) and gross margin
(Source: Verizon Annual Report | own computations)
*Wireline reporting changed in 2015

2.1.2 Wireline

The Wireline Service comprises services in the US and across the world. Verizon Wireline provides communications, products and enhanced services to households, business and governmental institutions. The products include enhanced solutions for data and video, corporate network, data centres and cloud solutions, as well as local and long-distance voice services. In 2018, this segment represented 22,5% of Verizon's total revenue.

In the last years, the transition from copper wires to fiber-optic networks have been the most relevant initiative in this segment. That technological improvement not only

[13] A one-time tax benefit occurred in that 2017 leading to a 90% increase in core net income results leading to a increase in core operating cash-flows
[14] Baldock, Harry (2020). Reducing 5G's energy consumption is 'an industry responsibility', says Ericsson. Total Telco

provides greater and faster information transmission but also allows a decrease in average costs for system maintenance by 39%[15].

Verizon Fios is the segment that provides fiber-optic communication services such as internet, television, and telephone to consumers. In 2005, the substitution of copper wires allowed Verizon to gain an advantage over its competition since it was the first company delivering the technology, having spent over $20 m in fiber-optic. Nowadays, it provides Fios services in 9[16] states mostly located on the east-coast, serving more than 150 m households.

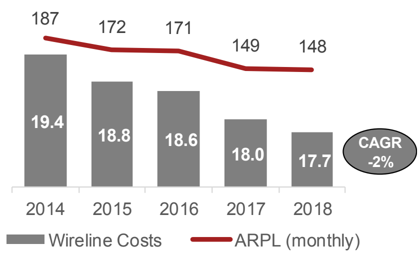


Figure 15 - Wireline operating costs (in $ billion) and ARPL
(Source: Verizon Annual Report | own computations

In terms of strategy, the segment is enhancing the Fios services to allow consumers to have higher flexibility in their communication plans. The expectation is a decrease in the segment churn rate, preventing also a decrease in the average revenue per line (ARPL).

Nonetheless, in the last five years, the growth of the Wireline Service's revenue has been decreasing, showing that its CAGR was -2,4%, even though Verizon was a pioneer on fiber-optic networks implementation. The declining in wireline revenues is mainly explained due to the sift of consumers preferences to wireless products, consumers are increasingly requiring products that confer remote access

Finally, Verizon Enterprise Solutions is focused on enabling enterprises to operate under a model infrastructure based on cloud services running on open platforms. Regarding that enterprise businesses, it is expected that the segment has opportunities to expand due to the digitalization global trend, which affects all economy's sectors.

2.1.3 Corporate and Other

All telecommunication providers are showing signs of maturing on their traditional operations. Since voice and data are services only differentiated by their quality and coverage, telecoms are being forced to opt to decrease service prices to increase their market presence. As an example, in order to increase 10%-15% in new customers, companies would be required to reduce their profits 2%-3% in the first quarter[17].

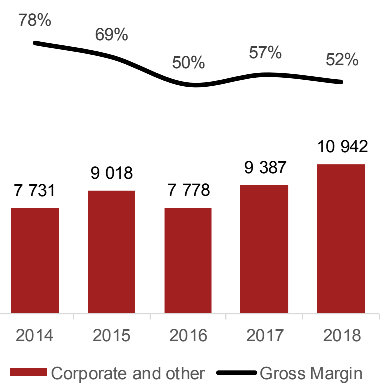


Figure 16 – Corporate and Other Segments Revenue and Gross Margin

In order to prevent losses in profits and retain more costumers, Verizon chose to enter on the digital advertisement market. Since consumers spend more than half

[15] OECD. 2008. *Broadband: It's The Green Network - OECD Workshop On Icts And Environmental Challenges*. Retrieved from https://www.oecd.org/sti/ieconomy/40833297.pdf
[16] New Jersey, New York, Maryland, Delaware, Massachusetts, Pennsylvania, Rhode Island, Virginia and Washington
[17] Financial Times. (2017). Price war expected to hit Verizon and AT&T profits https://www.ft.com/content/e392b30e-205f-11e7-a454-ab04428977f9

of their digital time on smartphones[18], Verizon is able to deliver valuable consumer experience to their customers using new digital channels.

In that way, AOL and Yahoo[19], both web provider services, were acquired by Verizon as a mean to deliver more services to its customers. In January 2020, Verizon Media registered 216 million visitors, placing the company as the third most accessed search engine. Google and Microsoft search engines registered 1 191 and 483 million visitors respectively. For the next years it is expected that Google maintains its leadership retain over 70% of the market.

Verizon's acquisitions on media enabled the entrance of the company on the advertisement sector. Verizon Media only represents 2%[20] of US search engine advertisement revenues due mostly to the dominance of Google on the market which own 73%.

This segment mostly incorporates non-traditional telecommunication services, it has an advantage to provide revenue diversification, while contributing to the company core values of disseminate the company's brand and service quality. It incorporates digital advertisement, digital content platforms but also includes Internet-of-things (IoT) business as well as other elements with low operationality.

2.2 Major Competitors

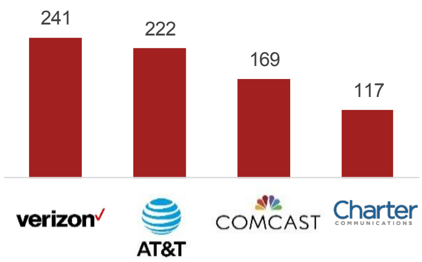


Figure 17 – Major companies by current market capitalization (in $ bn) (Source: Reuters)

The telecom market in the US, is primarily composed by US-based companies.

The main competitors that will be presented below are focused mainly on one sector, either wireless or wireline. However, similarly as Verizon, AT&T operates in both segments. Along with the two mentioned companies, Comcast and Charter constitute the four largest companies in the sector by market capitalization.

2.2.1 AT&T

In the US, AT&T is the second largest company in the wireless segment and the largest in wireline, 34% and 24% market share respectively. Beyond telecommunication services, the company also engages in the media business by owning Time Warner's film and TV production studios[21].

The media segment allows a vertical integration of the telecommunication company since it has made it a producer and distributor of content. Accordingly, the company

[18] Beaver, Laurie. (2018). How AT&T, Verizon, T-Mobile, and Sprint are overcoming slow user growth amid a fierce price war. Business Insider
[19] The acquired companies form Verizon Media operating under Verizon Media brand-name
[20] eMarkter. (2019). Google Dominates US Search, but Amazon Is Closing the Gap
[21] Time Warner portfolio includes CNN (3th most watched cable news network February 2020), HBO (which has more than 7 million visitors monthly in 2019), Warner Studios (sold around $2 bn on box office in 2019)

AT&T Key Figures	2018	2019
Sales	170 756	181 265
EBITDA Margin	0.33x	0.33x
Net Income Margin	0.11x	0.08x
Capex/Sales	0.26x	0.11x
Current Ratio	80%	79%
Net Debt/EBITDA	2.52x	2.72x
ROE	14.8%	14.2%
ROA	4.9%	4.8%
ROIC	7.8%	10.9%
Nº Subscribers	153 006	265 149

Table 1 - AT&T Key Metrics
(Source: Reuters | own computations)

can provide to its customers integrated billings which include telecommunication services and media streaming subscriptions, as well as other media contents [22].

AT&T is also focusing on 5G roll-out and enhancement of its network centres. Its network will support cloud platforms as Microsoft Azure and Google Cloud. Such agreements add flexibility to the firm[23] since AT&T will use infrastructure and business knowledge of its partners to enable its customers to access powerful computing processing services.

The strategy of AT&T is based around the best costumer experience on television, internet connections, and the wireless phone. The company aims is to integrate communications and entertainment into their delivered services in order to become de no.1 media and communications service provider.

2.2.2 T-Mobile and Sprint

T-Mobile USA is a subsidiary of Germany-based Deutsche Telekom AG. The company, which has been recently merged with Sprint, the fourth-largest wireless communications company in the US. Together will become the third largest wireless company in the US, based on revenue.

T-Mobile Key Figures	2018	2019
Sales	43 310	44 998
EBITDA Margin	0.29x	0.30x
Net Income Margin	0.07x	0.08x
Capex/Sales	0.13x	0.14x
Current Ratio	81%	74%
Net Debt/EBITDA	2.48x	2.19x
ROE	12.2%	13.0%
ROA	4.0%	4.4%
ROIC	9.1%	8.1%
Nº Subscribers	7 044	7 011

Table 2 - T-Mobile & Sprint Key Metrics (unconsolidated data with Sprint)
(Source: Reuters | own computations)

In any case, both companies were individually 3x smaller than Verizon and AT&T. It was a condition that has hindered their ability to compete on spectrum acquisition[24] and also blocked their ability to challenge the two largest players. T-Mobile will absorb spectrum licenses from Sprint, which increases its coverage and also increases its bandwidth, translating in a higher transmission efficiency. In that way, the new company will become a major threat on the market against Verizon and AT&T wireless services, since it will have a market share on wireless of ~30%, which represents only a difference of -4 p.p. against the two largest competitors.

The company is strategically planning to become the lowest-cost telecommunication provider. T-Mobile started its aggressive pricing five years ago and since than AT&T and Verizon have seen a reduction on their ARPU in the wireless segment.

2.2.3 Comcast

Comcast sells wireline services to both residential and business customers, typically bundled with fixed communications, internet, and TV. The company registers ~8% market share on the wireline industry being surpassed by AT&T (24.4%) and

[22] AT&T provide HBO Max (retail price $15/monthly) free of charge to a set of Wireline plans (https://www.att.com/hbo-max/)
[23] Patricia J. Daugherty, R. Glenn Richey, et. al. (2006). Is collaboration paying off for firms?. Business Horizons, Volume 49. Issue 1. https://doi.org/10.1016/j.bushor.2005.06.002.
[24] Sherman, Alex. (2018). An obscure 2017 telecom deal explains why T-Mobile and Sprint agreed to merge. CNBC

Verizon (13.5%). According to BroadbadNow[25], the company is the largest cable provider, in terms of area covered.

The company also provides wireless phone services, operating under Verizon[26] network and engages in the media business by owning broadcast network channels and a film studio[27].

Comcast Key Figures	2018	2019
Sales	94 507	108 942
EBITDA Margin	0.32x	0.31x
Net Income Margin	0.12x	0.12x
Capex/Sales	0.10x	0.09x
Current Ratio	79%	84%
Net Debt/EBITDA	3.58x	2.82x
ROE	16.9%	18.7%
ROA	5.4%	5.6%
ROIC	8.6%	9.4%
Nº Subscribers	n.a.	28 629

Table 3 - Comcast Key Metrics
(Source: Reuters | own computations)

Comcast sees, only on the wireless business, an opportunity to compete more closely with AT&T and Verizon since the two offer a more complete set of products and services. The company is not interested in start their own wireless network since the wireless service is only a complement of Comcats services[28].

Strategically, the company is chasing a new set of customers which only search for broadband access and streaming platforms. The new bundle is directed mostly to Millennials and people who value multiple platform content access. The new product will include 10,000 free movies and TV shows from Netflix, HBO, YouTube, Showtime, Amazon Prime Video and Amazon Music, Pandora and iHeartRadio[29].

2.2.4 CenturyLink

CenturyLink is a US regional phone provider that operates primarily in the western region since it is based in Louisiana. The company is the third largest company in the wireline segment in US (~9%).

CenturyLink Key Figures	2018	2019
Sales	23 443	22 401
EBITDA Margin	0.39x	0.40x
Net Income Margin	-0.07x	-0.24x
Capex/Sales	0.14x	0.16x
Current Ratio	4%	4%
Net Debt/EBITDA	0.69x	0.66x
ROE	5.8%	8.5%
ROA	1.7%	2.1%
ROIC	6.1%	12.4%
Nº Subscribers	n.a.	n.a.

Table 4 - CenturyLink Key Metrics
(Source: Reuters | own computations)

The company significantly increased its size and scope through M&A activity. Qwest, one of the "Baby-Bells", was acquired in 2011 by CenturyLink, constituting a boost on CenturyLink's presence in the market since it added 25 million new customers[30].

Verizon has partnering with CenturyLink on the wireless segment, which allow consumers to join on the CenturyLink bill Verizon Wireless expenses. There are multiple advantages on this partnership: Verizon Wireless has the potential to attract more subscriber in locations less covered by Verizon wireline services and CenturyLink gets the opportunity to provide wireless services to its customers.

CenturyLink services include traditional local and long-distance services, and also services digital TV network. The company will follow its last years' strategy, it will

[25] BroadbandNow. (2020). COVERAGE & AVAILABILITY MAP Retrieved from: https://broadbandnow.com/XFINITY
[26] Comcast act as a Mobile virtual network operator (MVNO) in the wireless segment
[27] The company owns Universal Studios (which accounted for more than 13% of all earnings at the box office in US in 2019), NBC (2nd most watched cable news network in US) and other network channels. It also operates in EU by Sky network
[28] Frankel, Daniel. (2018). Comcast and Charter to jointly develop common mobile operating platform. FierceVideo
[29] Spangler, Tood. (2019). Comcast's Over-the-Top Strategy: Expand Streaming Offering With Xfinity Flex. Variety
[30] Kumar, B. R. (2012). Mega Mergers and Acquisitions. Palgrave Macmillan..

continue to invest in fiber-optic coverage and focusing in the enhancement of business services using cloud[31]. However, due to its low market power, it is not considered a major threat for Verizon.

2.2.5 Charter

The company is a cable operator in the US and a broadband communications services company. Charter serves 30 million customers in 41 states[32]. The company has a reduced market share compared with its competition. However, the company is the second largest cable provider according to BroadbandNow[33].

Charter Key Figures	2018	2019
Sales	43 634	45 764
EBITDA Margin	0.37x	0.37x
Net Income Margin	0.03x	0.04x
Capex/Sales	0.21x	0.16x
Current Ratio	23%	52%
Net Debt/EBITDA	4.50x	4.45x
ROE	3.3%	4.9%
ROA	0.8%	1.1%
ROIC	4.5%	5.3%
Nº Subscribers	n.a.	1126*

Table 5 - Charter Key Figures
(Source: Reuters | own computations)

Main services of the company are internet access, fiber connectivity for data networking, video entertainment services and business telephone services. The operating business is very similar to the wireline segment of Comcats. However, Charter does not have the diversification of Comcast stock on media.

The company also owns a MNVO operating under the Verizon network. The MNVO service has a lower cost to consumers but it provides a poorer quality service, when compared with the services of the host operator[34]. Tutela[34] reported that MNVOs operating under Verizon network has the highest quality placing on their quality scores.

2.3 Trends

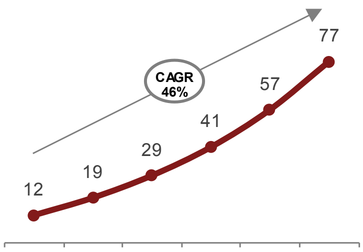


Figure 18 - Global mobile data traffic from 2017 to 2022 (in in exabytes per month)
(Source: Statista)

In recent years, the increase in usage of wireless at the expense of wireline services has been one of the trends that most has affected the sector. Besides, consumers' requirements for faster internet connections are impacting the market, since nowadays user are costumed to faster and fluid systems. Furthermore, the number of devices connected to the network has been increasing (i.e. presence of IoT and OTT services), which causes more transmissions of data.

The sector is facing major changes, since individuals and businesses are shifting from wireline to wireless services, mainly due to smartphone penetration whereas consumers covet for flexibility, that wired services cannot offer. The trend causes a decrease in wireline prices since it becomes a less attractive solution, pressuring companies to find new products to retain customers in wireline.

[31] Robuck, Mike. (2020). CenturyLink continues its fiber builds for consumer and business customers. FierceTelecom
[32] https://corporate.charter.com/about-charter
[33] BroadbandNow. (2020). COVERAGE & AVAILABILITY MAP Retrieved from: https://broadbandnow.com/Charter-Communications
[34] Tutela. (2018). US Mobile LTE Network Quality 2018. Retrieved from: https://www.tutela.com/hubfs/Assets/Tutela%20USA%20LTE%202018.pdf

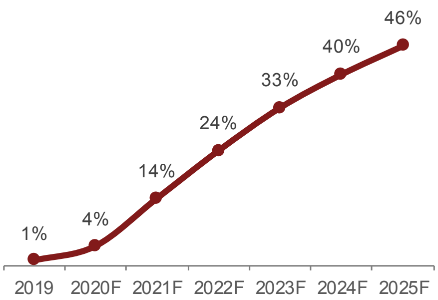


Figure 19 - Forecast of the 5G adoption rate as share of mobile connections in North America from 2019 to 2025
(Source: Statista)

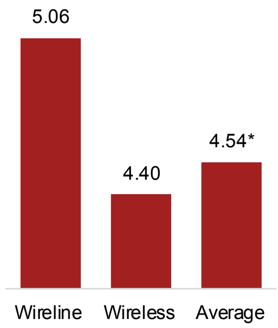


Figure 20 - Average increase that U.S. consumers are willing to pay for 5G services (in $)
(Source: Strategy&, 2019 and own calculations)
*The average was computing using a weighted average on total US revenue on each segment

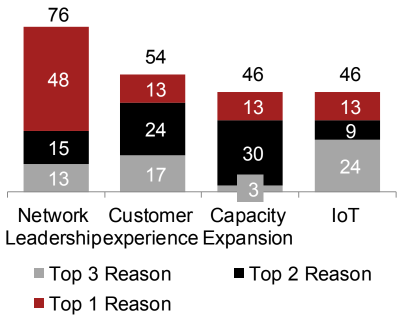


Figure 21 – Four most reported reasons for 5G roll-out (by top reason)
(Source: McKinsey 5G Survey 2018)*

5G is one of the most important trends for the next years. 5G opex costs per gigabyte are 20%[35] lower when compared with 4G technology and it can connect one million devices per square-meter, which is 100 times higher than 4G connection capability. Since 5G can also enhance wired connections through fiber-optic, this technological advancement will cause a positive impact on a company's operating performance.

Given 5G characteristics, new products will arise, since consumers can have faster connections, leading to an expected increase of $4.5[36] on wireless ARPU. As 5G represents a heavy investment decision, capex is expected to more than duplicate[37]. Network providers are required to acquire more cell sites and to upgrade most of its network in order to transmit that technology, which could represent a decrease on ROIC[37], due to the necessity to increase financing cash-flows. It is not expected that the improvement of operationality will surpass the increase on capex.

Furthermore, IoT integration, in cars or houses is expected to boost an increase in data traffic. That data can be used by telcos to deliver data analysis services (thought Artificial Intelligence and Big Data), to enhance customer profiling but also it can be monetized on other sectors[38].

Secondly, as some traditional services provided by telcos are being replaced by internet-based solutions[39], network operators are becoming progressively application providers [40] (e.g. OTT platforms).

Since consumers use increasingly OTTs, telcos are partnering with OTTs to reward customers the consumption of their content. It can reduce churn rate, preventing customers to switch to other telecom providers, which causes an increasing of profitability (i.e. average mobile operator spends between 15% to 20% of revenue to retain and acquire customers).

Nonetheless the telecommunication sector has been consolidating and expanding over the last years. Nowadays, less than 2% of US population live on an area with less than three competing carries which makes the market highly competitive.

Furthermore, Telcos are required, in order not to cease, to continuously improve their services implying improvement of its operationality. In the future

[35] Orange SA. (2020, February 7). 5G and energy efficiency: new mechanisms for progress. Retrieved from https://hellofuture.orange.com/en/5g-energy-efficiency-by-design/
[36] Strategy&. (2019). Making 5G Pay. PwC
[37] DBS. (2017). THE PUSH FOR 5G: SHAKING UP THE LANDSCAPE. DBS ASIAN INSIGHTS SECTOR
[38] Ouyang, Y., Hu, M., Huet, A., & Li, Z. (2018). Mining Over Air: Wireless Communication Networks Analytics. Springer International Publishing.
* The full graph can be found in https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/cutting-through-the-5g-hype-survey-shows-telcos-nuanced-views
[39] VoIP (Voice over Internet Protocol) is a telephony solution mostly used in business segments where voice connections using internet protocols rather than public switched telephone network (PSTN)
[40] Czarnecki, C., & Dietze, C. (2017). Reference architecture for the telecommunications industry. Progress in IS.

telecommunications services may have to become wholesalers instead of participating directly in retail. MNVOs allow host companies to have lower costs on customer acquisition and contribute to the network to operate closer to full capacity.

Figure 22 – Examples of OTT Applications

2.4 Verizon Strategic Positioning

As it was referred above, Verizon will focus its next years on the 5G rollout. For 2020, the company expects to additional spend between \$17.5 billion and \$18.5 billion on capex casing 5G expansion[41], expecting in 2020 a less than 5% revenue growth, which is in line with sectors competing firms expected growth.

Verizon technological strategy to rollout 5G is based on millimeter wave spectrum. The millimeter wave approach has lower propagation potential making the rollout more expensive than using lower band. However, it takes up with more connected devices in a dense urban area[42]. Therefore, Millimeter wave proofs to be advantageous on a scenario where IoT is highly disseminated.

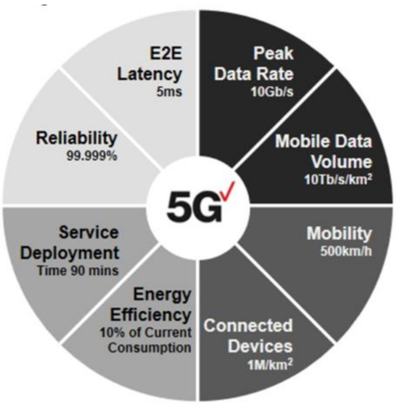


Figure 23 - 8 benefits of 5G
(Source: AWS re:Invent 2019 – Hans Vestberg of Verizon Talks About Collaborating With AWS on 5G)

Verizon was the first telecom to rollout 5G and to partner with a cloud company to potentiate its services with "edge computing"[43]. Verizon will partner with Amazon Web Services (AWS), which is the largest company on cloud platform services (market share is estimated for 2020 to reach 52%, Microsoft and Google market shares are respectively estimated to reach, 21% and 18%).

Partnerships are an important strategy since confer to the company an inimitable attribute which competitor may have difficulty to surpass[44]. Accordingly, In Wireline and Wireless segments, Verizon's services offer Disney+, YoutubeTV or AppleMusic on the monthly billing in order to attract customers.

As mentioned in the previous section, T-Mobile strategy is based on becoming a lowest-cost wireless provider. Due to its market power, T-Mobile is pushing Verizon wireless ARPU to decrease. To prevent such event, Verizon wireless plans are focusing to differentiate its service though quality[45], combining also OTT platforms integration with Verizon's services.

Corona Virus Outbreak

[41] Technology News. (2020). Verizon raises 2020 capital expenditure in 5G push. Reuters
[42] Holma, H., Toskala, A., & Nakamura, T. (2020). 5G Technology: 3GPP New Radio. John Wiley & Sons.
[43] A distributed programming system where requests are brought closer to the location where were required instead of traveling longer distances (from the requested location to the data center or storage location) providing lower computing time processes.
[44] Johnson, G., Scholes, K., & Whittington, R. (2008). Exploring corporate strategy: text & cases. Pearson education.
[45] RootMetrics considers Verizon as having the best wireless service for the 13th consecutive time (https://www.verizon.com/about/our-company/awards-recognition)

Verizon Key Figures	2018	2019
Sales	130 863	131 868
EBITDA Margin	0.36x	0.36x
Net Income Margin	0.12x	0.15x
Capex/Sales	0.13x	0.14x
Current Ratio	91%	84%
Net Debt/EBITDA	2.38x	2.31x
ROE	40.5%	34.8%
ROA	7.5%	7.2%
ROIC	13.3%	14.3%
Nº Subscribers	117 999	147 887

Table 6 - Verizon Key Figures
(Source: Reuters | own computations)

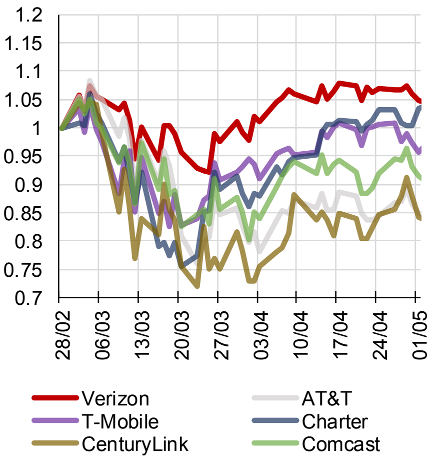


Figure 24 - Stock return from 28/02/2020 to 1/05/2020
(Source: Reuters | own computations)

Early in April, Moody's had assessed that multiple sectors impacts to COVID-19. It concluded that telecom was part of less impacted sectors[46] to the early global crisis of COVID-19.

Over the last months, due to the COVID-19, more people are spending time home which has put telcos under pressure since the network is experiencing a peak. Verizon reported an increase of 20%[47] in data traffic compared with base line usage on the network. Although traffic increased, they were able to maintain the network capability with the same capacity margin[48].

In a scenario of crisis and recession in the next years, it is expected for wireless to stand a better chance than wireline to prosper. Due to the potential SMB[49] bankruptcy and reduction of traffic tariffs, it is expected a decrease in subscribers lines leading to a decrease on revenues, which was estimated to be -2% following GDP projections.

On the other hand, since disposable income of consumers decreases on economic downturns, it can favour T-Mobile's strategy of providing services at the lowest cost. Consumers will prefer simpler plans which behold only essential services, which will impact Verizon margins, expecting to drop 14% in wireless ARPU in a scenario in which Verizon follows T-Mobile wireless ARPU.

The stock market has been more active over the last weeks, given the uncertainty regarding short-term growth and profitability of companies due to the virus.

Between March and May, Verizon performed better than other companies, mainly the ones which have diversified into media business (such as AT&T and Comcast), those companies have been affected by content production call off and the decrease on ad revenues due to reduction of consumer spending. Verizon proved to be a resilient company being minorly affected by the impact of an expected global crisis.

3. SWOT Analysis

Verizon is a well-known brand in the US. It has been considered to have the best mobile network by RootMetrics assessment[50] for the 13th consecutive time. Using their strong brand, the company can sell innovative solutions conferring a differentiating factor against its competitors. An example of such trait was the ability

[46]Birade, Laurent. Partridge, James. (2020). Dual risk rating and origination strategies: optional (until they are not)?. Moody's Analytics.
[47] Morwa, Rida. (2020). Play Defense With High Dividends: Buy Verizon, 4.3% Yield And Upside. Seeking Alpha
[48] Verizon. (2020). 1Q 2020 Earnings. Verizon
[49] Small and mediuam business
[50] US State of the Mobile Union: carrier performance at national, state, and metro levels 2H 2019, http://rootmetrics.com/en-US/content/us-state-of-the-mobile-union-2h-2019

of the company to issue debt during market panic due to COVID-19, in March. Verizon issued $3.5 bn in debt with a maturity of 30 years and YTM[51] of 3.5%[52] which is a YTM similar to previous issuances (Appendix 5).

Since telcos have low ability to diversify their products, companies are competing based on prices which has shrunk their margins. In Verizon, gross margin as been decreasing ~1% per year, from 2014 to 2018.

Strengths
- Brand and image
- Spectrum license
- US market leader
- Economies of scale

Weaknesses
- Declining wireline market
- Vodafone aquisition
- Inability to compete based on price

Opportunities
- 5G Strategy
- Lease Tower
- Global growth and expansion
- Media and advertising

Threats
- Limited FiOS coverage
- Competition
- Infrasructure investment
- Low diversification

Figure 25 – Verizon SWOT Analysis

The aggressive 5G strategy can unlock opportunities for the company, which is better positioned than its competitors, given the fact that the company was the first to launch the service. The company will be able to capture non-regular connections in the IoT sector which has a potential to increase 140% yearly from 2020 to 2023[53].

Due to the change of people preferences in terms of connectivity, the company shifted its strategy to focus on broadband and wireless connection growth, which offsets the decline on the wireline segment. During the last years, Verizon had the possibility to spin-off assets on less profitable units. As an example, Verizon sold wireline assets on 17 states for $17.3 bn[54] to Frontier, which confers the ability to monetize assets strategically out of scope.

Another advantage present on Verizon's assets is the spectrum licences. FCC[55] manages and licences the electromagnetic spectrum through auctions. Usually, the licenses are issued for a 10-year period, conceding rights to transmit signals over specific bands. The company in 2018 owned around 50% of the 28 GHz spectrum licenses for the US, and 40% of the 39 GHz licenses.[56]

Verizon's portfolio is mainly composed by low to mid band frequencies, which enable coverage even in rural and suburb locations. In case of surplus in bandwidth, these band frequencies can be rented to other companies (such as T-Mobile) at a premium, since these have shortage of low-band frequencies[57].

Communication towers are a key asset on this sector since they are the component that transmits the spectrum frequencies. However, the infrastructures represent

[51] Yield To Maturity
[52] Conrad, Roger. (2020). Verizon Communications And The Next Internet Boom. Forbes
[53] Based on Gartner data on IoT 5g endpoint
[54] The amount sold respects to the total assets sold between 2010 and 2015
[55] The sector is strongly regulated by the Federal Communication Commission (FCC) a governmental institution which fosters competitive dynamics on the sector and ensures that the US legislation is followed. FCC performance impacts telecom systematic risk since it impacts revenue due to regulatory measures but also instantly adjust prices and provide financing on the presence of unexpected shocks (e.g. hurricane disasters).
[56] Data retrieved from Tutela, Spectrum analysis - how Verizon's diverse spectrum holdings are the key to success, November 2018
[57] Band-width is connected to larger coverage and better quality voice and data traffic. By renting spectrum avaibility to companies which have low band-wiidth, Verizon is able to monetize its surpluses

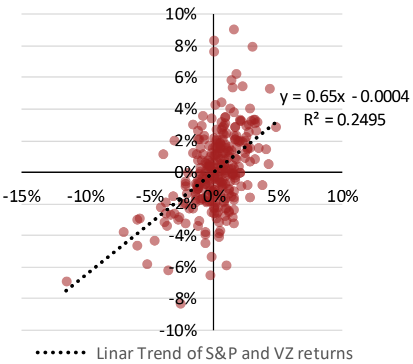


Figure 26 - Scatter between S&P500 and returns of Verizon (11/07/2014 to 06/03/2020)
(Source: Reuters | own calculations)

Companies	Annualized Returns	Annualized Volatility
Charter	18%	28%
Verizon	**12%**	**19%**
Sirus	12%	21%
T-Mobile	8%	22%
Comcast	5%	20%
Viasat	4%	27%
AT&T	1%	21%
U.S Cellular	-2%	36%
TELE & DATA SYSTEMS	-3%	32%
Altice USA	-6%	36%
Dish	-16%	35%
CentryLink	-18%	37%

Figure 27 - Annualized Arithmetic Returns and Volatility (30/06/2017 to 06/03/2020)
(Source: Reuters | own computation)

high investment with low profit margin. For this reason, towers are being co-owned between multiple companies[58].

The company also has the possibility to sell their communication towers. In 2015, American Towers acquired 11,300 communication towers from Verizon. Since Verizon is estimated to own 2,000 cell towers and over 4,200 rooftop sites[59], they can continue to perform these operations since promote flexibility into the company's cost structure, turning the towers fixed cost into a variable.

Taking into account that Verizon's 5G strategy will require massive investment on spectrum band acquisitions and new infrastructure to improve its 5G coverage and network density[60]. It may imply that future financing structure may increase company's risks since it is expected to increase debt obligations.

Verizon in 2013, agreed to buy Vodafone's positioning in the wireless services of Verizon. The transaction doubled Verizon's debt burden which has been stable ever since. By predicting that interest rates may not follow the same low and stable trend of the last years, due to budget deficits and higher inflation caused by COVID-19 pandemic, it can represent a threat to global financial stability[61] and a difficulty for the company to meet its financial obligations.

4. Stock Performance

Over the last four years, Verizon has outperformed Dow Jones Telecommunication Index in 0.74 p.p.. Dow Jones attained an annualized arithmetic return of 0.95%. Contrarily, S&P500 Index outperformed Verizon, whereas the first mentioned achieved annualized returns of 7.12% while the second one achieved 1.67%, respectively[62].

Despite the telecom industry indicates a worse performance than the market, the stock levered beta was below 1. Verizon's levered beta[63] reached 0.65[64], implying that the stock has a lower sensitivity of its returns resulting on a lower systematic risk.

[58] Recently Verizon and AT&T are partnering in order to build new towers that allow an increase of coverage. The main disadvantage is that companies cannot use same band frequencies effecting on additional interferences
[59] According to Vertical Consultants in 2017
[60] 5G requires new radio frequencies, using mostly high band which are called *Millimeter waves.* This chunk of the spectrum has a lower propagation than the band used for 3G or 4G. A possible solution to overcome the problem is the usage of *small cells* on top of buildings which are smaller and require less energy expenditures than cell towers
[61] IMF. (2020). Global Financial Stability Overview: Markets in the Time of COVID-19. https://www.imf.org/en/Publications/GFSR/Issues/2020/04/14/global-financial-stability-report-april-2020
[62] Computations based on stock prices from 11/07/2014 to 06/03/2020
[63] Levered beta was computed accordingly with CAPM theory explained on WACC valuation section
[64] In 1% increase (decrease) return of the market, the company return will increase (decrease), on average, by ~0.65%.

Companies	D/E	Interest Coverage Ratio
Sirius	0.28	4.9
Viasat	0.33	-22.9
T-Mobile	0.42	3.9
U.S Cellular	0.47	1.3
Verizon	**0.48**	**6.2**
Comcast	0.55	5.4
AT&T	0.70	3.5
Charter	0.80	1.5
CenturyLink	2.40	1.7
Tele & Data	0.85	1.1
Dish	0.93	143.1
Altice US	1.53	1.1
Average	0.81	3.1*

Table 7 - Capital Structure (Debt to Equity) average of last three fiscal periods and Interest Coverage Ratio of 2018
(Source: Reuters | own computations)
*Average excluding outliers

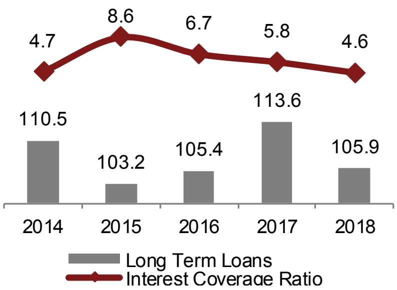


Figure 28 – Verizon's Historical interest coverage ratio and Long Term Debt (in $ billion)
(Source: Verizon Financials | own calculations)

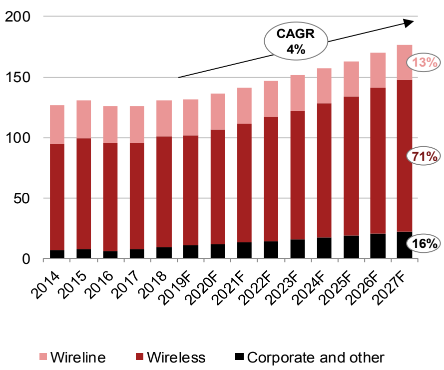


Figure 29 - Revenue forecast
(Source: own computations)

Comparing Verizon stock against other comparable companies[65], it represented one of the largest annualized returns (12.0%). The stock also exhibits the lowest volatility of the group, which implies that Verizon is a solid company with a steady and predictable growth.

4.2 Capital Structure

Given the set of companies considered as Verizon's comparables, the company has one of the lowest debt to equity ratios (D/E[66]) ~48%. The industry presents an average of 81%. T-Mobile, Viasat and U.S Cellular have a lower exposure to debt than Verizon (42%, 33%, 47% and 48% respectively), however the biggest competitor, AT&T, presents a D/E of ~70%.

Verizon has been decreasing its debt amount, as shown in Figure 28. The company has obtained a stable credit rating, by Moody's, of Baa1, which has not been changed since 2013. In 2018, the debt amounted to $111.489 m and consisted mostly of corporate bonds with fixed coupons.

The company presents a strong financial position which enables a possible increase of external financing in order to cope with 5G investments. But, the company has been facing a decrease on the interest coverage ratio, mostly explained by a decreased in EBIT and increase in interest payments. Nonetheless, with a ratio of 4.6 the company is still able to meet its financial obligations.

Other firms, which compete with Verizon, have on average, higher debt obligations in proportion to their market capitalization. That relation also brings impact on interest coverage ratio bore by the company, which are on average lower than Verizon's, for example AT&T and T-Mobile had in 2018, 3.5 and 3.9, respectively.

5. Valuation

5.1 Discounted Cash Flow Valuation

Verizon's present value was estimated based on future cash flows mostly depending on revenue analysis, cost drivers, and invested capital.

5.1.1. Revenue Decomposition

Considering all the reporting segments previously described, revenues are expected to grow 4% yearly over the forecasted period, which goes from 2019 to 2027. It was estimated that both Wireless and Corporate and Others will continue

[65] Comparable companies were choose according to the priciples states in Appendix 2 and will
[66] In market value term

to expand (from 2019 to 2027, the CAGR will grow from 3% to 6%, respectively) while Wireline is expected to decrease 2.8%.

The Wireless segment will continue to represent the largest share of the company's revenue, increasing its position in ~2 p.p. between 2018 and 2027. In 2027, the segment was assessed to represent ~71% of total revenue, which represents a 1.3% increase in relation to 2018.

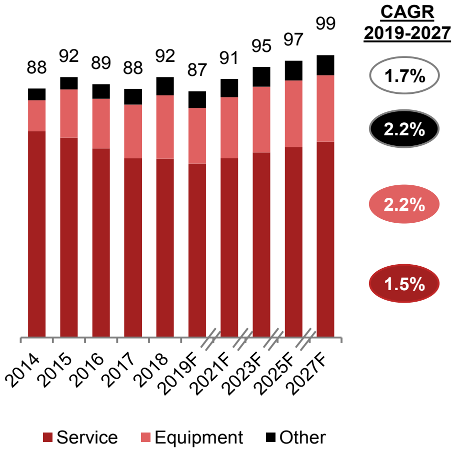


Figure 30 - Wireless revenue detailed (in million $ bn)
(Source: own computation)

In terms of telcos services, their prices have declined dramatically over the last 20 years. That decrease could be explained not only by the improvements in efficiency due to technological innovation, but also due to effective regulation which constraints service monopolization[67].

Since sale prices decreased, Verizon is pressured to create new service bundles and optimize existent solutions to promote client retention and maintain its revenues.

Wireless

On the forecast, the Wireless revenues will continue to yearly grow 0.6 p.p. more than the registered on the historical period (2014-2018).

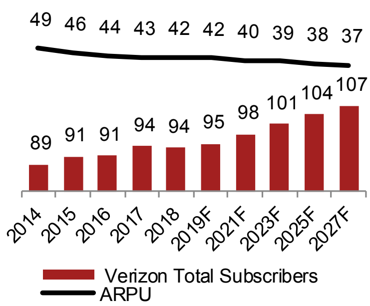


Figure 31 – Verizon customer base (in million) and ARPU
(Source: own computations)

Due to the multiplicity of services provided by the segment, the forecasted values for Service were based on market share, customer base, and wireless ARPU. Regarding Equipment and Other, the values were based on the service number of connections, demand for smartphones, and average price of equipment.

The value driver of the Mobile consumer base was computed using the US mobile penetration saturation, assuming that the first stated measure would be 83.4% of the second, due to their historical relationship[68].

To compute Verizon's market-share, in an as-is scenario, it was assumed that market share of competing firms in the segment would be maintained. The shares were computed using time series forecast which led to a result where Verizon would have ~35% market share, followed by AT&T ~34% and T-Mobile[69] ~30%.

The forecasted average revenue per user (ARPU) was defined using the relation between the US Average ARPU for post-paid and prepaid services, adjusted to inflation with the Verizon's ARPU during the historical period. In the as-is scenario, the ARPU is forecasted to decrease 1.8% yearly. The decrease is supported by the fact that companies compete on prices creating a pressure in a descendent trend.

[67] Gruber, H., & Koutroumpis, P. (2013). Competition enhancing regulation and diffusion of innovation: the case of broadband networks. Journal of Regulatory Economics, 43(2), 168-195.
[68] A measure which incorporates the interconnection between population above 10-year-old, population above poverty rate and a multiple-sim factor (the average of sim cards per person)
[69] Consolidated values

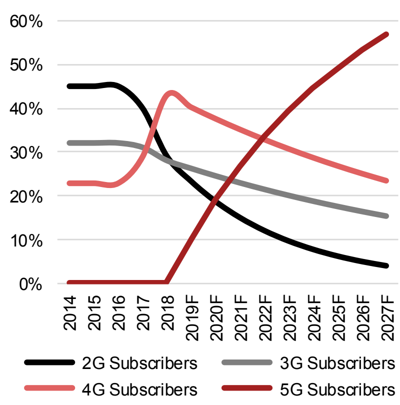


Figure 33 - Subscribers Type forecast
(Source: own computation)

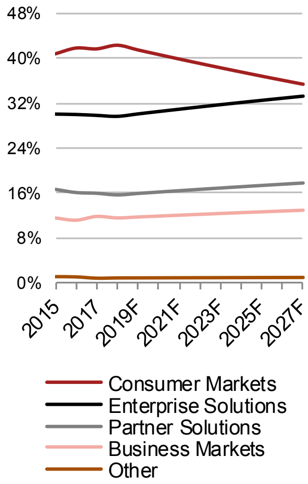


Figure 32 - Wireline revenues decomposition
(Source: own computations)

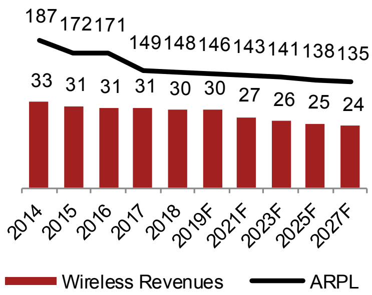


Figure 34 - Forecasted Wireline Revenues (in $ billion) and ARPL (in $)

The forecasted values ensure a stable churn rate. Historically, that rate has been always lower than 1.5% and in the forecasted period it was assumed a 1.2% churn rate. That rate foresees that the company will lose, on average 1.2%, of its subscribers, yearly, even considering a positive net addition rate (~1.5%).

Until 2022 it is expected that equipment and other wireless revenues per subscriber will increase 4%, yearly. That increase is mostly described by the fact that current devices, owned by general public, are not compatible with 5G. However, after that period, a decrease on equipment device prices (~-2% yearly) as well as a shrink in the average number of acquired smartphones is expected. The penetration of smartphones and the increase of equipment lifecycle were the main factors considered in the forecast which led to -1% growth yearly in equipment revenues.

Wireline

As it was mentioned in the trends section of the report, the wireline segment expects a decrease in its activity. The segment's revenue can be supported by loyalty programmes that merge wireline and wireless services, and can also include partnerships with other companies[70]. The programme yields higher flexibility but also promotes a decrease in the churn rate of both wireless and wireline services.

When companies perform cross-selling and deliver value-added solutions to their customers its churn rate decreases, which leads to a decrease in average cost of subscriber acquisition. This relation acts as a competitive advantage against other competing firms[71] since acquisition costs represent a considerable operating cost on telcos business model.

By breaking down the number of connections in the historical period, it was found that the segment had its revenues decreased in 2.9% yearly. Since Verizon has shifted most of its interest to the Wireless segment, it is expected that the number of connections keeps decreasing at the same rate as in the historical period.

In order to assess the market share in this segment, instead of using the number of subscribers, extracted from the US population, it was based in the number of households[72]. This assumption allowed to outline the difficulty to forecast the number of business and their dimension using Verizon services, seaming also plausible, since the majority of the segment was composed by the Consumer Market.

[70] Examples of partnerships are Disney+ monthly access on wireline bundle services, availability of Netflix on Fios TV, and, access to Youtube TV for FiOS internet customers.
[71] Roebbeling, K. I. (2003). " Eventually, you will bond for life": A study of the relationship between Event Marketing and Customer Bonding. diplom. de.
[72] The result of the market share per household led to the measurement of the customer base as number of lines. Each line will represent a household connected to Verizon's wireline.

Given that the number of connections in each line have been decreasing, it was forecasted a -1.1% decrease over the forecasted period. It is also expected that the average price per line (ARPL) experience a decrease ~1%, yearly, which matches to the ARPL decrease over the historical period.

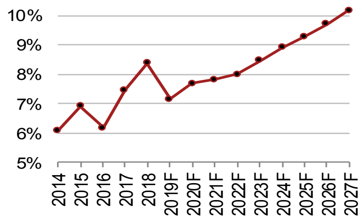


Figure 35 - Corporate and Other as % of total revenue
(Source: Own computations)

As Partner Solutions, Business Markets and Other represented less than 15% of 2018 overall revenues, the 3 components of wireline revenues were not estimated individually. Their forecasted revenue stream was computed under the Consumer Market results.

However, given the fact that IP protocols, cloud and machine to machine (M2M) solutions are expected to stimulate the Enterprise Solutions division, that division will experience an expected increase of 3 p.p. in its relevance on the segment revenue. Accordingly, it is expected that Verizon would be able to increase its market share in the wired communication field.

Corporate and Others

The segment which comprises Verizon Media was forecasted to represent an average of ~9% of total revenue, as Figure 35 represents. That percentage has potential to increase over time since the business segment is inserted in a growing sector.

According to the PwC Global Entertainment & Media Outlook[73], the search engine and the digital advertisement sector is expected to grow. The market expects to increase yearly 8.3% in the US and 9.5% globally from 2019 to 2023, according to PwC's report.

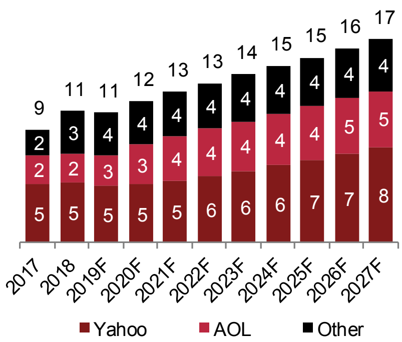


Figure 36 - Corporate and Other total revenues (in $ billions)
(Source: Own computations)

By analysing the business segment and market share of Yahoo! and AOL, which are integrated in Verizon's product portfolio, it was estimated a revenue yearly growth of 6% from 2019 to 2027.

Knowing that Google attains the largest market share of this business segment, controlling over 90% of search queries[74]. Yahoo! is left with a 2.83% market share[75], being the third most accessed search engine. This "monopoly", held by Google, has been under regulatory scrutiny recently[76], meaning that in case official bodies decide to spin-out Google segments due to antitrust practices, Yahoo! may face an

[73] Van Eeden, E. V., & Chow, W. (2019). Global Entertainment & Media Outlook 2019–2023. PwC.
[74] Liang, F., Qian, C., Hatcher, W. G., & Yu, W. (2019). Search engine for the internet of things: Lessons from web search, vision, and opportunities. IEEE Access, 7, 104673-104691.
[75] StatCounter. (March 25, 2020). Worldwide desktop market share of leading search engines from January 2010 to January 2020. Statista.
[76] Reed, Kevin. (21 May 2020). US government to file antitrust lawsuit against Google this summer. Worls Socialist Website

increase its market share of ~5%[77] which could represent an increase in 130% revenues generated by Yahoo!.

Companies	Gross Margin	Operating Margin
Sirius	60%	30%
Tele & Data	54%	4%
Altice USA	67%	17%
Comcast	69%	20%
Verizon	**58%**	**18%**
AT&T	53%	16%
Dish	29%	16%
Charter	52%	12%
T Mobile	58%	12%
Viasat	30%	-6%
CenturyLink	54%	2%
U.S.Cellular	55%	4%
ATN International	75%	14%

Figure 37 - Profitability Margins in 2018
(Source: Reuters)

In a nutshell, Corporate and Others segment is expected to have a better performance than the other two segments. In the forecasted period the services of this segment are expected to be more demanded since they attain lower similarity with other comparable businesses, having potential to be more prosperous on growing at a yearly rate of ~6% during the forecasted period.

5.1.2 Margins and Costs

The telecom sector suggests a high gross margin, which on average, in 2018, was 55% of total sales. As Figure 37 shows, Verizon is well positioned considering its competitors, presenting stable metrics on both gross and operating margins over the last couple of years as well as registering the highest of ROIC in the set its largest comparables. Nonetheless, it was experiencing a slight yearly decrease of -0.3% and -4%, in its gross and operating margins affecting its profitability mainly due to the decrease on average price per user/line.

Companies	ROA	ROE	ROIC
Verizon	**7%**	**40%**	**13%**
Dish	5%	20%	10%
Comcast	5%	17%	9%
AT&T	5%	15%	8%
T-Mobile	4%	12%	9%
CenturyLink	2%	6%	6%
Charter	1%	3%	4%
Tele & Data	3%	3%	n.a.
U.S Cellular	3%	3%	n.a.
Altice US	0%	0%	6%
Viasat	-2%	-4%	n.a.
Sirius	14%	-70%	34%

Figure 38 - ROA and ROE analysis in 2018
(Source: Reuters)

The several communication providers present an average difference of 43 p.p. between the gross and operating margins. The difference emphasizes the impact of new investments that the sector faces.

Although Verizon experienced a decrease on both margins, it was able to increase its profit margin from 10.8% in 2016 to 12.3% in 2018 which can be explained due to a decrease on effective tax rate and interest expenses.

Return on assets and equity is a mean to analyse business efficiency. As reported in Figure 38, Verizon is one of the firms that has higher results on both ratios. From 2016 to 2018, the yearly growth in the ROE of Verizon was -31%. Regardless of the decline of the metric, the company still has the highest ROE in relation to its comparables. In that way, their ability to generate earnings from its assets and equity is above average for the sector.

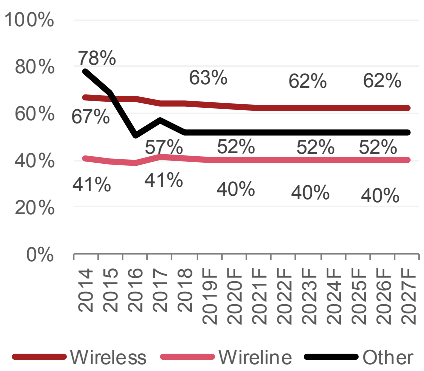


Figure 39 - Gross Margin
(Source: Own computations)

Verizon's cost structure is divided into cost of service, wireless cost of equipment, and Selling, general and administrative expense (SG&A).

The first two mentioned costs are directly related to the service provided. Cost of service includes wages, supply materials, infrastructure related costs and customer provisioning costs. However, since the components of cost of services are not disclosed, the forecast was based on the revenue of each component.

The wireless equipment costs forecast, was based on the acquisition cost of devices which include smartphones and other devices used to deliver wireless services to

[77] Assuming that Google would go from its 90% market share to 73% which is Baidu market share as a search engine in China.

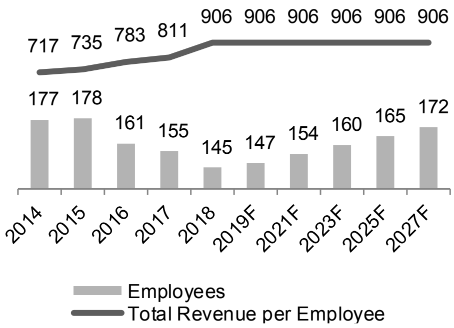


Figure 40 - Number of Employees Forecaste (in million)
(Source: Own compuations)

customers. The forecasted cost of that component will follow the price growth of equipment as well as the demand for this type of products.

Due to the impactful future of 5G, the Wireless segment is the only one that will be further examined. Through the technological improvements in the sector, it is expected that gross margin will increase after the implementation period of 5G.

SG&A account for expenses not directly attributed to Verizon services includes expenses such as salaries and employee benefits, advertising costs, sale commissions, regulatory fees, and customer support. Since it is not possible to breakdown SG&A, the expenses were forecasted using the number of employees, which was derived by total revenue. The result suggested that SG&A will growth an average of 1.66% per year, which leads to an operating margin ~30%.

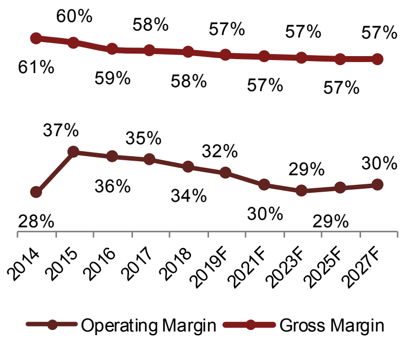


Figure 41 – Gross and Operating Margin
(Source: Own computations)

Furthermore, it is expected a decrease in the operating margin (EBITDA Margin). That decrease is explained by the increase of renting cost per m^2 in communication towers and small cells[78] ,since they tend to be located close to urban areas due to 5G diffusion. Besides, as the new technological improvement resorts on more data traffic, the company needs more powerful infrastructures. Since infrastructure increases, it leads to an increase of energy consumption (~4x more energy consumed[79], which represents of 10-15% of a company opex structure[80]), the margin will decrease also due to that technological requirements.

Another factor that leads to a deterioration of the company's ability to generate operating profits is the expected increase in SG&A. The new products that arise with 5G are expected to be monetized rapidly, which will impact employee benefits, giving them higher commissions and spending more resources in call-centre activity.

5.1.3 Capital Expenditure

To cope with the required investment to enter in 5G market, Verizon will have to increase its capital expenditure.

According to Reuters[81], the company reported that its capital expenditures would increase $17.5 bn in 2019 and $18.5 in 2020 due to 5G. The estimates suggest that on an as-is scenario, the company will invest in 2020 $29.5 bn.

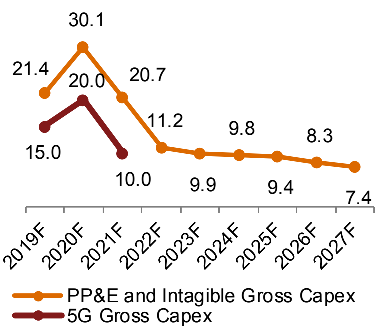


Figure 42 - Increase on fixed and intangible assets (in $ billion)
(Source: own computation)

[78] Small station which disseminate network coverage, usually employed closed to urban areas
[79] Awad, Rany. (February, 2020). Software roadmap and supplier relationship manager, Sofrecom
[80] Marsch, P., Bulakci, Ö., Queseth, O., & Boldi, M. (Eds.). (2018). 5G system design: architectural and functional considerations and long term research. John Wiley & Sons.
[81] Thomson Reuters. (2020). Verizon raises 2020 capital expenditure in 5G push. Retrieved from https://www.reuters.com/article/us-verizon-capex/verizon-raises-2020-capital-expenditure-in-5g-push-idUSKBN20Z394

According to Oughton et al.[82], the millimetre wave network Verizon is using on 5G, is the most recommended to dense urban areas since high frequency enables an increase in network capacity. Adapting the Oughton model used to predict 5G costs in the UK to the US reality, it can be expected that it would be required a global investment of ~$50bn to roll-out 5G in the US[83].

Given that the Oughton model-based estimate uses a scenario in which, rural areas share infrastructures between different companies[84][85] and that the total investment Verizon reported is $36 bn, in the valuation was used a total investment for 5G of $45 bn which is a mean value between the two estimates.

After 2022, Verizon is expected to decrease capital expenditure since no other technological improvements besides 5G are foreseeable in the near future. The capex investments will be at historical level, having company's revenue as driver over the forecasted period.

5.1.4 Weighted Average Cost of Capital (WACC)

The Cost of capital is an important estimate on a valuation. It considers the cost of the available financing instruments Equity and Debt. For the computation of this value, the capital structure employed was assumed equal to the average D/E (in market values) of Verizon in the last three years. Given the computations described below, the WAAC estimated was 5.3%.

Cost of Equity	
Risk free - Yield to maturity of 10y US treasury bond	1,9%
Market risk premium	6,6%
Levered beta	0,8
Cost of Equity	**7,1%**

Figure 43 - Cost of Equity
(Source: Own computations)

Cost of Equity

The equity cost was computed using the CAPM, a cost of equity of 6.9% was derived.

The risk-free was derived using the value of the yield to maturity of the US government bond with 10-year maturity as of 02/01/2020. The choice was made upon the idea of matching the time horizon of the bond with the investment in order to minimize inflation risk and its effect on market risk[86].

The market risk premium was calculated using the geometric average of returns and the estimate was compared against the market risk premium benchmark[87]

82 Oughton, Edward. Frias, Zoraida. (2016). Exploring the Cost, Coverage and Rollout Implications of 5G in Britain. ITRC Mistral
83 Since the repot estimatesestimated the UK territory costs to roll out 5G, it was used population difference between US and UK in order to use the report conclusions as proxy. It was assumed that between the two countries, telecos have the same cost structure as well as the same technology deployed in the country.
84 Shared infrastructures for 5G are a trait which has been highlighted in the US market.
85 Grijpink, Ferry. Ménard, Alexandre. Sigurdsson, Halldor. Vucevic, Nemanja. (2018). The road to 5G: The inevitable growth of infrastructure cost. McKinsey
86 Mukherji, Sandip, The Capital Asset Pricing Model's Risk-Free Rate (2011). The International Journal of Business and Finance Research, Vol. 5, No. 2, pp. 75-83, 2011. 7
87 Fernandez, Pablo and Martinez, Mar and Fernández Acín, Isabel, Market Risk Premium and Risk-Free Rate Used for 69 Countries in 2019: A Survey (March 23, 2019)

Levered Beta	
Unlevered beta - sector average	0,56
D/E	0,48
Corporate income tax	27%
Levered beta	0,8

Figure 44 - Levered Beta
(Source: Own computations)

Cost of Debt	
YTM on Verizon LT Bonds	2.8%
Probability of Default	1.6%
Recovery Rate	61%
Cost of Debt	**2.2%**

Figure 45 – Cost of Debt
(Source: Own computations)

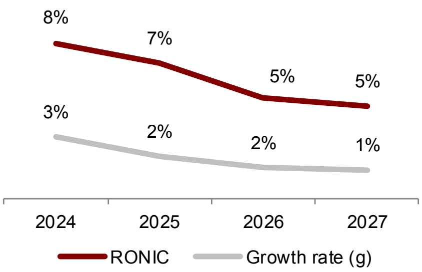


Figure 46 - RONIC and Growth rate in the forecasted period between 2024 and 2027
(Source: Own computations)

(based on a survey performed in 2019 in more than 60 countries). It was revealed that a 6.6% MRP fitted into the 95% confidence interval of the values found in the survey, which implies that it is a reasonable estimate.

The unlevered β was computed using the median value of the unlevered β of a set of comparables and Verizon. Each company was regressed against the market index benchmark, attaining more than 314 observations on each regression. All companies used as comparables achieved a R^2 higher than 20% and a significant p-value. More details on the regression results are available on

Appendix 3.

The unleveraged β employed was 0.56, which represents the median[88] value across the comparables. An unleveraged β lower than 1 was expected since the telecommunication sector is characterized as a basic utility. Regulated utilities usually have a lower levered beta than an average equity and usually ranges between 0.4 and 0.9[89].

Cost of Debt

In order to estimate the cost of debt it was computed the yield to maturity (YTM) of long-term Verizon bonds. The YTM was adjusted to account with the probability of default given the company's rating (Baaa for Moddy's and A- in Fitch). Given the estimates of Elton et. al.[90] for the recovery rate and the probability of default for Verizon's rating (60.6% and 1.6% respectively for the mentioned estimates). The method resulted in a cost of debt of 2.2%.

5.5.5 Value creation drivers

After discounting the future expected cash-flows to their present value, the company on an as-is scenario is valued at $64 per share, including the dividend per share.

Since Verizon is described as a mature company, it is expected that RONIC and growth rate present similarities with the WAAC and long-term growth. Investment rate is also stabilizing after this period (~1%), meaning that after 2027, it should be applied the perpetuity formula.

Regarding the assumption on the growth rate used on the perpetuity, it was assumed to be equal to the revenue stream growth rate, which is 2%. According to

[88] The decision was based on the advantages of median since it decreases the impact of outlier on the data set
[89] Khatib, H. (2003). Economic evaluation of projects in the electricity supply industry (No. 44). IET.
[90] Elton, E. J., Gruber, M. J., Agrawal, D., & Mann, C. (1999). Is there a risk premium in corporate bonds?. New York University Stern School of Business working paper available at pages. stern. nyu. edu/~ eelton/working_papers/Is_there_a_risk_ premium_in_corporate_bonds_2. pdf.

OECD[91], the real GDP growth rate until 2060, for the US, is projected to be 2.0%, which is lower than the real growth rate expected for the world economy (2.9%).

As it has been considered that long term inflation is expected to be set on 2.3% yearly, the model describes a more conservative growth rate than the one it could potentially achieve if it follows the US economy nominal growth rate (4.3%). The assumption seems reasonable since Verizon is inserted in a sector that has fewer opportunities to grow than other sectors, such as the technological, which explains difference between both the US and Verizon growth rate.

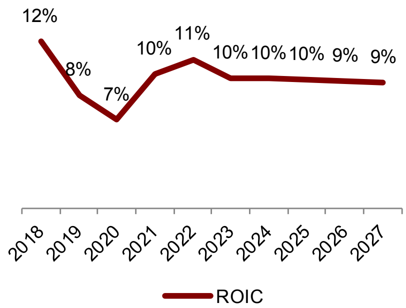


Figure 47 - Verizon's ROIC in the forecasted period
(Source: Own compuations)

The company registers a consistent ROIC of (~9%) as well as a consistent net Margin (~19%). Due to 5G investments, in 2019 and 2020, Verizon's ROIC is expected to decrease, reaching its lowest at 6%. By analysing the 5G proportion on net operating profit, it is possible to analyse that it has a negative impact on ROIC. In 2019, 5G accounted for 1% for ROIC, and in 2027 it will increase to 4% which implies that 5G will have efficiency gains in the company.

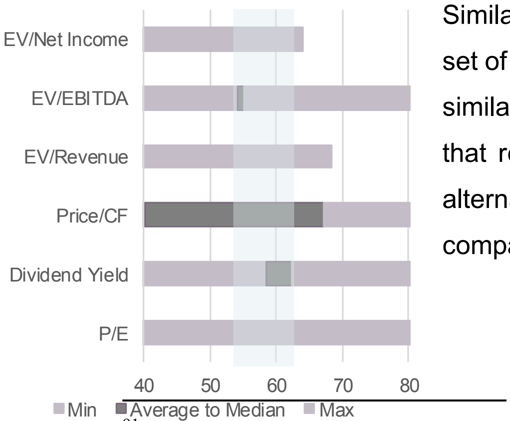
Since the company will increase its invested capital, the firm will become even more exposed to debt. It is expected that in 2021 and 2022, the FCF for operation business will be negative due to the increase on invested capital, which leads to a Debt coverage ratio of -0.06 in 2021 0.0 in 2022.

However, the debt coverage ratio during the forecasted period, will never be below 4 times EBIT, expect for 2020 since it is the year that registers the largest growth in Long-Term Debt.

5.2 Relative Valuation

A relative valuation was used as a complementary approach to determine the Verizon's share price. That approach assumes that, by taking the average price of similar assets, the market prices the target correctly[92].

Similar performance and main activity based on the US were criteria to choose the set of comparable companies. When asserting comparability, it was considered the similarity of risk bared by the comparable companies since finance theory defines that reward depends on risk. The idea was to mix the traditional approach and alternative described by Kulali et. al.[93] (Appendix 2) to decide the set of comparable companies.



[91] OECD (2020). OECD Interim Economic Assessment. Coronavirus: The world economy at risk. OECD.
[92] DAMODARAN Aswath (2001), "The Dark Side of Valuation: Valuing Old Tech, New Tech, and New Economy Companies", Chapter 8, FT Press.http://www.ucema.edu.ar/u/jd/Inversiones/Libros/LibroA/ch8N.pdf
[93] Kulali, İ., & Bilir, H. (2014). The Link between Anti-Trust and Finance: A Suggestion for Relative Valuation. International Journal of Business and Social Science, 5(4).

Figure 48 - Valuation Ratio Comparison
(Source: Reuters | own computation

By analysing Figure 48, the price range this valuation method implies for 31/12/2020 is \$57-\$62. Due to the subjectivity of this method the conclusion should be interpreted with caution. Due to the large operating costs on the telecom industry and differences on financial structure between companies, EV/EBITDA is considered a better estimate than Revenue or Net Income. This multiple has as driver depreciation and amortization schedules which can very largely since this is a capital-intensive industry.

Using the last year earnings, P/E is not expected to lead to wrong estimates since Verizon is not expected to change neither company's risk nor operating activity[94], the same applies to comparables, as this sector is highly consolidated and mature.

As a result of the analysis, the price range this valuation method suggests for 31/12/2020 is \$55 to \$62. Due to the subjectivity of this method the result should be used with caution.

6. Conclusion

The analysis presented pointed out Verizon as a strong player due to its positioning on the sector. The company has the second largest market share on the wireless segment, the largest market share on the wireline segment and is also able to deliver valuable solutions to their business segment by partnering with major companies, such as AWS and Disney. Verizon has been a first mover on new technological opportunities which is a relevant factor that incorporates value in the company.

On the other hand, since the customer base is getting saturated, there will be pressure to acquire new customers, which leads major players to compete on prices in order gain comparative advantage. The opportunity to improve earnings is also being reduced due to spectrum licencing requirement. The licenses, which are an important issue for telecommunication activity, are scarce and strictly controlled by FCC. Moreover, since they are auctioned, the price per license is expected to increase over time which can decrease further operating margins.

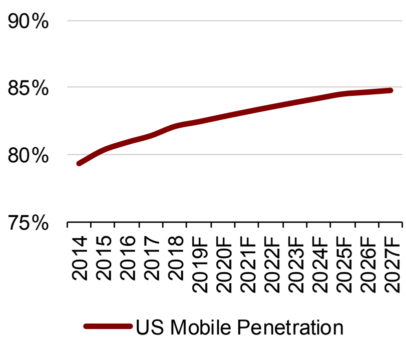


Figure 49 - US Mobile Market Penetration

A scenario analysis was performed, in order to understand how different inputs could affect Verizon's valuation. That analysis draws conclusions about as-is, optimistic and pessimistic scenarios on Wireless, Wireline, and Corporate and other segments, and also on the ability to invest on assets to support the operating activity. Under the as-is scenario, it is expected that Verizon is able to implement 5G but will not be able to change its presence on the market. The company will mostly grow accordingly to the historical growth.

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[94] Stowe, J. D., Robinson, T. R., Pinto, J. E., & McLeavey, D. W. (2007). Equity asset valuation (Vol. 4). John Wiley & Sons.

Segment	Scenario 1	Scenario 2
Wireless	As-Is	As-Is
Wireline	As-Is	Pessimistic
Corporate & Other	As-Is	Optimistic
Investments	As-Is	As-Is
Shareholder Value	**64.4**	**64.0**

Segment	Scenario 3	Scenario 4
Wireless	Optimitic	Optimistic
Wireline	As-Is	Pessimistic
Corporate & Other	As-Is	Optimistic
Investments	Pessimistic	As-Is
Shareholder Value	**68.5**	**80.8**

Figure 50 - Scenario Analysis

For the optimistic scenario, the company will be the first to implement 5G and, as result, it will have an increase on its market share. Under the assumption of winner-takes-all, Verizon would become the market leader on wireless segment with a market share between 90% to 100%. However, due to the lack of country-wide coverage it was expected an increase on its market share of ~35% to ~48%.

Under the pessimistic scenario built over the idea that Verizon would reduce its market positing due to an increase of competitivity, the company would see its presence reduced from ~35% to ~30% in the wireless segment.

The scenarios also include different levels for wireline operations and for Corporate and Other presence on the market. In the case of invested capital, the scenario analyses different investment requirement levels which impact value creation measures.

The as-is scenario (Scenario 1) yields to a share price of $62[95]. The four scenarios that were draft in Figure 50, contrast in how each segment can affect the valuation. Only scenarios 1 and 2 are considered the most probable, which concludes that the recommend shareholder price should be set on $64.

The price is also consistent with the sensitivity analysis. By changing WACC, over the assumptions that levered β could reach the company's levered β[96] (computed under CAPM assumptions), the WACC would be set in 5.2% which would lead to a stock price of 64$. This theoretical experiment concluded that a price between $62-$64 would be acceptable for Verizon's valuation since it uses fair assumptions.

	WACC		
Long-Term Growth	5.2%	5.4%	5.70%
1.9%	64	59	51
2.0%	67	62	53
2.2%	72	67	57
2.4%	79	72	62
2.6%	86	79	67
4.3%	287	235	172

Figure 51 - Sensitivity Analysis
Source: Own computations)

Although the multiple analysis suggests a lower valuation, it was determined that the shareholder value should be set on $64 which leads to a HOLD recommendation, signalling investors not to sell and neither to buy the stock.

Even though the company is undervalued at the moment, this is not an enough reason to recommend a BUY. In addition, although the company has a clearly defined strategy towards 5G, it will be increasingly exposed to debt which increases operational risk as well as it will face higher operational costs after 5G dissemination.

At the moment, Verizon as well as the global economy, is under a tremendous amount of uncertainty due to COVID-19. Nonetheless, although Verizon is not expected to be highly affected, it is hard to be optimistic in a valuation regarding the end of 2020 since economic indicators are pointing to a recession.

[95] Share price differes from shareholder value since the last includes $2.3 dividend
[96] Representing a decrease from 0.8 to 0.65

Appendix

Appendix 1 - Top Verizon's individual shareholders in 2019

Investor Name	Shares (in thousands)	Position
Lowell McAdam	400	Former CEO
Marc Reed	145	Executive Vice President and Strategic Advisor
John Stratton	116	President of Verizon Entreprise Solutions

Investor Name	Shares (in thousands)	Position
John Stratton	116	President of Verizon Entreprise Solutions
Mattew Elis	48	CFO
Anthony Skiadas	38	Principal Accounting Officer
Hans Vestberg	23	CEO

Appendix 2– Criteria for comparables (according to Kulali et. al.)

Traditional Approach	Alternative Approach
Sector – Telecommunication Services	Risk – Unlevered Beta ~0.6
Product – Wireless and/or Wireline and/or Satelite services	ROIC - >10%
Geography – US	

Appendix 3 - Detailed table on comparables regression

Companies	Market Index Benchmark	Levered Beta	P-Value Slope	Slope Intercept	P-Value Intercept	R^2
VERIZON COMMS/d	.SPX	0.65	0.000%	0.000	80.657%	22%
AT&T/d	.SPX	0.71	0.000%	-0.001	55.636%	25%
T MOBILE US IN/d	.IXIC	0.73	0.000%	0.001	41.135%	21%
COMCAST CORP A/d	.IXIC	0.73	0.000%	0.000	88.033%	32%
CHARTER COMM O/d	.IXIC	0.80	0.000%	0.002	20.224%	21%
CENTURYLINK IN/d	.SPX	1.20	0.000%	-0.004	5.783%	22%
SIRIUS XM HOLD/d	.IXIC	0.82	0.000%	0.000	77.270%	38%
U.S.CELLULAR C/d	.SPX	0.99	0.000%	-0.001	54.906%	15%
TELE & DATA SY/d	.SPX	1.15	0.000%	-0.002	46.555%	23%
DISH NETWORK A/d	.IXIC	1.05	0.000%	-0.003	10.211%	26%
VIASAT INC/d	.IXIC	0.90	0.000%	-0.001	56.515%	23%
ALTICE USA A/d	.SPX	1.29	0.000%	-0.003	46.801%	21%
ATN INTERNATIO/d	.IXIC	0.49	0.001%	-0.001	80.485%	6%

All intercepts are slopes are reject in a >5% significance
On the other hand the slope is not statistically rejected
Since most regressions have an R^2 above 20%, only ATN will be rejected due to the low realibility on the beta estimates, it has a value divergent from average

Appendix 4 - Comparables Subsector and Market Cap

Company	Ticker	Headquarter Country	Industry Subsector	Market Cap
Verizon	VZ	US	Integrated Telecommunication Services	$ 223,328
AT&T	T.N	US	Integrated Telecommunication Services	$ 212,111
T-Mobile	TMUS.OQ	US	Wireless Telecommunication Services	$ 116,644
Comcast	CMCSA.OQ	US	Cable & Satellite	$ 177,774
Charter	CHTR.OQ	US	Cable & Satellite	$ 106,730
CenturyLink	CTL.N	US	Alternative Carriers	$ 10,657
Sirius	SIRI.OQ	US	Cable & Satellite	$ 22,750
U.S Cellular	USM.N	US	Wireless Telecommunication Services	$ 2,608
Tele & Data	TDS.N	US	Wireless Telecommunication Services	$ 2,054
Dish	DISH.OQ	US	Cable & Satellite	$ 14,967
Viasat	VSAT.OQ	US	Communications Equipment	$ 2,599
Altice US	ATUS.K	US	Cable & Satellite	$ 14,434

Appendix 5 - Long Term issued bond

Long Term Securities	Price	Yield	Effective YTM (own computation)
VZ 4.862 21-Aug-2046	$ 135.05	2.9%	2.7%
VZ 4.522 15-Sep-2048	$ 130.52	2.9%	2.7%
VZ 4.672 15-Mar-2055	$ 134.21	3.1%	2.9%
VZ 5.012 21-Aug-2054	$ 141.64	3.1%	2.9%
VZ 5.012 15-Apr-2049	$ 139.00	3.0%	2.8%

Appendix 6 - DCF Summary

WACC	5.4%		
NPV Core Business	390,179		
Non Core Business Assets	(17,890)	# Shares	4,291
Enterprise Value	**372,288**		
Cash and Equivelents	29,009		
Debt	(140,665)	**Share Price**	**60**
Minority Interest	(1,565)	Dividends per share	2
Equity Value	**259,068**	Share Price including Dividends	63

Appendix 7 -Income Statement

In USD million	2014	2015	2016	2017	2018	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F
Revenue														
Wireless	87,646	91,680	89,186	87,511	91,734	97,798	101,305	104,738	108,099	110,468	113,076	115,784	118,475	121,154
Wireline	32,793	31,150	30,510	30,680	29,760	29,839	28,375	27,180	26,246	25,560	25,113	24,647	24,168	23,682
Corporate and other	7,731	9,018	7,778	9,387	10,942	10,826	11,783	12,553	13,287	14,000	14,715	15,436	16,170	16,922
Eliminations	-1,091	-1,172	-1,494	-1,544	-1,573	-1,522	-1,566	-1,514	-1,515	-1,573	-1,645	-1,680	-1,716	-1,753
Total Revenue	127,079	130,676	125,980	126,034	130,863	136,941	139,897	142,958	146,116	148,456	151,260	154,187	157,098	160,005
COGS														
Cost of services	(28,306)	(29,438)	(30,463)	(30,916)	(32,185)	(32,968)	(33,011)	(33,126)	(33,380)	(33,793)	(34,388)	(35,003)	(35,368)	(35,533)
Wireless cost of equipment	(21,625)	(23,119)	(22,238)	(22,147)	(23,323)	(25,362)	(26,534)	(27,708)	(28,883)	(29,516)	(30,213)	(30,936)	(31,655)	(32,371)
Total COGS	-49,931	-52,557	-52,701	-53,063	-55,508	-58,330	-59,545	-60,834	-62,263	-63,308	-64,601	-65,940	-67,023	-67,904
Gross Margin	77,148	78,119	73,279	72,971	75,355	78,611	80,352	82,124	83,853	85,148	86,659	88,248	90,075	92,101
Operating Expenses	(41,016)	(29,986)	(28,102)	(28,592)	(31,083)	(32,956)	(34,441)	(36,039)	(37,683)	(39,167)	(40,825)	(42,572)	(44,373)	(46,234)
EBITDA	36,132	48,133	45,177	44,379	44,272	45,656	45,911	46,084	46,170	45,981	45,834	45,676	45,702	45,867
Depreciation and Amortization	(16,533)	(16,017)	(15,928)	(16,954)	(17,403)	(25,183)	(25,126)	(19,140)	(13,130)	(12,514)	(13,297)	(12,424)	(11,802)	(11,342)
EBIT	19,599	32,116	29,249	27,425	26,869	20,472	20,785	26,944	33,040	33,467	32,537	33,252	33,900	34,525
Interest income	108	115	59	82	94	107	107	107	107	107	107	107	107	107
Other components of net periodic benefit cost	0	0	-2,190	-11	3,068	0	0	0	0	0	0	0	0	0
Other, net	-1,302	71	-1,658	-2,092	-798	-812	-831	-851	-871	-891	-911	-932	-953	-975
Interest cost	(4,163)	(3,752)	(4,376)	(4,733)	(4,833)	(4,833)	(5,100)	(6,013)	(6,281)	(6,462)	(6,627)	(6,802)	(6,961)	(7,105)
Equity in losses of unconsolidated businesses	1,780	-86	-98	-77	-186	0	0	0	0	0	0	0	0	0
Net Profit Before Tax	16,022	28,464	20,986	20,594	24,214	14,934	14,960	20,187	25,995	26,221	25,106	25,625	26,092	26,552
Tax Expense / Income tax payable	(3,314)	(9,865)	(7,378)	9,956	(3,584)	(5,752)	(5,673)	(6,217)	(7,971)	(9,238)	(8,263)	(8,268)	(8,613)	(8,902)
Net Income	12,708	18,599	13,608	30,550	20,630	9,182	9,287	13,970	18,024	16,983	16,842	17,357	17,479	17,650

Appendix 8 - Cash-Flow Statement

in $ milion	2014	2015	2016	2017	2018	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F
Core result	14,187	21,019	17,901	33,630	21,133	12,632	12,937	18,445	22,670	21,602	21,577	22,211	22,441	22,712
Core Invested Capital	140,049	139,830	150,167	175,826	177,541	178,113	191,101	214,475	234,597	241,339	245,651	253,200	259,699	265,519
Change in Core Invested Capital		(219)	10,337	25,659	1,715	572	12,988	23,374	20,121	6,742	4,312	7,548	6,500	5,819
FCF Core Business	**14,187**	**21,238**	**7,564**	**7,972**	**19,417**	**12,059**	**(51)**	**(4,929)**	**2,549**	**14,860**	**17,264**	**14,663**	**15,941**	**16,892**
Non core result	1,227	19	(1,449)	(4)	(1,276)	78	78	78	78	78	78	78	78	78
Non core Invested Capital	(22,429)	(15,422)	(19,677)	(14,862)	(11,204)	(18,074)	(17,890)	(18,015)	(18,498)	(18,823)	(19,247)	(19,760)	(20,308)	(20,884)
Changes in non Core Invested Capital		7,007	(4,255)	4,815	3,658	(6,870)	184	(124)	(483)	(325)	(424)	(513)	(548)	(576)
FCF Non-core Business	**1,227**	**(6,989)**	**2,806**	**(4,819)**	**(4,934)**	**6,948**	**(106)**	**202**	**561**	**403**	**502**	**591**	**626**	**654**
FCF Operational	**15,414**	**14,250**	**10,370**	**3,153**	**14,484**	**19,007**	**(157)**	**(4,727)**	**3,110**	**15,263**	**17,766**	**15,254**	**16,567**	**17,546**
Total Invested Capital	**117,620**	**124,408**	**130,490**	**160,963**	**166,337**	**160,039**	**173,211**	**196,461**	**216,099**	**222,516**	**226,404**	**233,440**	**239,392**	**244,635**
Financial Result	**(1,436)**	**(3,000)**	**(721)**	**(3,090)**	**(4,737)**	**(3,528)**	**(3,723)**	**(4,389)**	**(4,581)**	**(4,709)**	**(4,827)**	**(4,953)**	**(5,067)**	**(5,169)**
Net Debt	**103,944**	**106,566**	**106,458**	**116,276**	**111,627**	**102,890**	**112,936**	**129,078**	**139,115**	**139,055**	**138,751**	**143,593**	**150,165**	**159,256**
Change in Net Debt		2,622	(108)	9,819	(4,650)	(8,737)	10,046	16,142	10,037	(59)	(305)	4,842	6,572	9,091
Equity	**13,676**	**17,842**	**24,032**	**44,687**	**54,710**	**57,149**	**60,274**	**67,383**	**76,984**	**83,461**	**87,654**	**89,847**	**89,227**	**85,379**
Change in Equity		4,166	6,190	20,655	10,023	2,439	3,125	7,108	9,601	6,477	4,193	2,193	(620)	(3,848)
Comprehensive Income	13,978	18,038	15,731	30,536	15,120	9,182	9,292	14,134	18,167	16,971	16,827	17,336	17,452	17,620
FCF Financial	**(15,414)**	**(14,250)**	**(10,370)**	**(3,153)**	**(14,484)**	**(19,007)**	**157**	**4,727**	**(3,110)**	**(15,263)**	**(17,766)**	**(15,254)**	**(16,567)**	**(17,546)**

Appendix 9 – Balance Sheet

In USD million	2014	2015	2016	2017	2018	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F
Assets														
Property Plant and Equipment (Net Book Value)	89,947	83,541	84,751	88,568	89,286	99,885	110,455	117,522	121,216	124,614	128,358	131,544	134,310	136,745
Intangible Assets (Net Book Value)	5,728	7,592	8,897	10,247	9,775	11,548	13,093	14,545	16,022	17,429	18,896	20,410	21,941	23,487
License Fee (Wireless)	75,341	86,575	86,673	88,417	94,130	91,997	93,464	94,937	96,416	97,902	99,395	100,894	102,196	103,512
Investments in unconsolidated businesses	802	796	1,110	1,039	671	671	671	671	671	671	671	671	671	671
Goodwill	24,639	25,331	27,205	29,172	24,614	24,614	24,614	24,614	24,614	24,614	24,614	24,614	24,614	24,614
Other Long Term Assets	6,628	17,985	9,149	9,787	11,717	11,717	11,717	11,717	11,717	11,717	11,717	11,717	11,717	11,717
Non-Current assets held for sale	-	10,267	613	-	-	-	-	-	-	-	-	-	-	-
Other assets	6,628	7,718	8,536	9,787	11,717	11,717	11,717	11,717	11,717	11,717	11,717	11,717	11,717	11,717
Total Non-current Assets (excl. Other Long term Assets)	**203,085**	**221,820**	**217,785**	**227,230**	**230,193**	**240,432**	**254,014**	**264,007**	**270,657**	**276,946**	**283,650**	**289,850**	**295,449**	**300,746**
Cash and Cash Equivalents	10,598	4,470	2,880	2,079	2,745	17,686	29,009	19,013	13,043	16,927	21,282	20,129	16,865	10,873
Inventories	1,153	1,252	1,202	1,034	1,336	1,404	1,433	1,461	1,493	1,517	1,547	1,578	1,602	1,622
Accounts Receivable	13,993	13,457	17,513	23,493	25,102	26,268	26,835	27,375	27,928	28,360	28,878	29,419	29,954	30,486
Prepayments and Other Current Assets	3,879	3,176	4,800	3,307	5,453	4,729	4,943	5,163	5,388	5,598	5,831	6,077	6,330	6,590
Assets held for sale	-	792	882	-	-	-	-	-	-	-	-	-	-	-
Short-term Investements	555	350	-	-	-	-	-	-	-	-	-	-	-	-
Prepaid expenses and other	3,324	2,034	3,918	3,307	5,453	4,729	4,943	5,163	5,388	5,598	5,831	6,077	6,330	6,590
Total Current Assets	**29,623**	**22,355**	**26,395**	**29,913**	**34,636**	**50,087**	**62,220**	**53,011**	**47,852**	**52,401**	**57,539**	**57,202**	**54,750**	**49,571**
TOTAL ASSETS	232,708	244,175	244,180	257,143	264,829	290,519	316,233	317,018	318,509	329,347	341,189	347,052	350,199	350,316
Equity														
Share Capital	424	424	424	424	429	429	429	429	429	429	429	429	429	429
Common stock in treasury	-3,263	-7,416	-7,263	-7,139	-6,986	-6,986	-6,986	-6,986	-6,986	-6,986	-6,986	-6,986	-6,986	-6,986
Additional paid in capital	11,155	11,196	11,182	11,101	13,437	11,993	12,251	12,498	12,751	12,948	13,184	13,431	13,675	13,918
Deferred compensation - employee stock ownership plans and other	424	428	449	416	353	369	377	385	393	399	406	414	421	429
Retained Earnings (Net income - dividends paid)	2,447	11,246	15,059	35,635	43,542	47,409	50,268	57,122	66,463	72,736	76,685	78,624	77,752	73,654
Dividends		*9,304*	*9,314*	*9,525*	*7,621*	*8,764*	*10,079*	*11,591*	*13,329*	*15,329*	*17,628*	*20,272*	*23,313*	*26,810*
Accumulated other comprehensive income	1,111	550	2,673	2,659	2,370	2,370	2,370	2,370	2,370	2,370	2,370	2,370	2,370	2,370
Total equity attributable to equity holders of parents	**12,298**	**16,428**	**22,524**	**43,096**	**53,145**	**55,584**	**58,709**	**65,818**	**75,419**	**81,896**	**86,089**	**88,282**	**87,662**	**83,814**
Non-Controlling Interest	**1,378**	**1,414**	**1,508**	**1,591**	**1,565**	**1,565**	**1,565**	**1,565**	**1,565**	**1,565**	**1,565**	**1,565**	**1,565**	**1,565**
Total Equity	**13,676**	**17,842**	**24,032**	**44,687**	**54,710**	**57,149**	**60,274**	**67,383**	**76,984**	**83,461**	**87,654**	**89,847**	**89,227**	**85,379**
Liabilities														
Long Term Loans	110,536	103,240	105,433	113,642	105,873	111,737	132,596	138,403	142,253	145,837	149,622	153,076	156,171	159,070
Employee benefit obligations	33,280	29,957	26,166	22,112	18,599	28,383	28,996	29,579	30,177	30,643	31,204	31,787	32,366	32,941
Deferred income taxes	41,578	45,484	45,964	31,232	33,795	43,446	42,924	28,683	14,599	13,521	15,198	13,104	11,491	10,249
Other Long Term Liabilities	5,574	12,600	12,245	12,433	13,922	12,068	12,328	12,576	12,830	13,029	13,267	13,515	13,761	14,005
Total Non-Current Liabilities	**190,968**	**191,281**	**189,808**	**179,419**	**172,189**	**195,633**	**216,845**	**209,241**	**199,859**	**203,029**	**209,290**	**211,482**	**213,789**	**216,265**
Bank Overdraft and Others	2,735	6,489	2,645	3,453	7,190	7,588	8,068	8,422	8,656	8,874	9,104	9,314	9,503	9,679
Accounts Payable	16,680	19,362	19,593	21,232	22,501	21,929	22,386	22,826	23,314	23,691	24,159	24,642	25,027	25,334
Other Current Liabilities	8,649	9,201	8,102	8,352	8,239	8,220	8,660	9,147	9,696	10,292	10,982	11,766	12,653	13,660
Total Current Liabilities	**28,064**	**35,052**	**30,340**	**33,037**	**37,930**	**37,737**	**39,114**	**40,394**	**41,666**	**42,857**	**44,245**	**45,723**	**47,183**	**48,673**
TOTAL LIABILITIES	**219,032**	**226,333**	**220,148**	**212,456**	**210,119**	**233,370**	**255,959**	**249,635**	**241,525**	**245,887**	**253,535**	**257,205**	**260,972**	**264,937**
TOTAL EQUITY AND LIABILITIES	**232,708**	**244,175**	**244,180**	**257,143**	**264,829**	**290,519**	**316,233**	**317,018**	**318,509**	**329,347**	**341,189**	**347,052**	**350,199**	**350,316**

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Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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